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CONTENTS

Page

Private Physician Health Examinations Improve the Elementary School Health Services Program 243
Harold Cornacchia, Assistant Professor of Health Education.

Health Knowledge of Teachers 247
James A. Fikes, Ph.D.

A Study of General Health Knowledge of Male Freshmen College Students at Pennsylvania State University 250
Elmer A. Gross, Ed.D., and Arthur F. Davis, D.P.H.

The Incidence of Hearing Loss in Kentucky School Children 253
Frank Kodman, Jr., Ph.D.; Charles E. Acuff, M.A.; Kenneth R. Stockdell, B.A.

Dental Health Education Experiences for Dental Students 260
Anita M. Ellingson, M.P.H. and Robert G. Kesel, D.D.S., M.S.

Opportunities for Integrated Educational Activities in the Program for the Prevention of Tuberculosis 264
Vera C. Naegele, M.D.

Children — Bigger and Bigger 267

News and Notes 246, 249, 252, 258, 263, 268

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THE JOURNAL OF SCHOOL HEALTH

Research Quarterly of the American Association of Health, Physical Education, and Recreation, 24:18-21, March, 1953.

Vol. XXVII NOVEMBER, 1957 No. 9

PRIVATE PHYSICIAN HEALTH EXAMINATIONS IMPROVE THE ELEMENTARY SCHOOL HEALTH SERVICES PROGRAM

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Elementary school administrators who seek ways to make their health service program more effective should consider having student health examinations performed by family physicians rather than by school physicians. Although this is a generally recommended practice, [1], [2], [3], [4] many school districts do not have a large percentage of parents who cooperate. Among the reasons for this lack of cooperation is the failure on the part of schools to encourage this practice. Justification for health examinations by private doctors can be found in any of the following reasons:

1. The physician undoubtedly knows the background of the child and family and, therefore, is usually in a better position to give a more comprehensive examination.

2. Parents who do not have private physicians should be advised to acquire them for emergencies as well as for other services.

3. Fundamentally, except in cases of need, the responsibility for the health maintenance, protection and health promotion of the schoolage child rests with the home and not the school.

4. Schools generally do not have the finances to employ enough physicians to provide adequate, frequent, examinations for all children.

5. In rural areas, probably the only examinations received by many school children will be those completed by private physicians since these schools generally cannot, or do not, employ school physicians.

6. The school's primary function is to provide educational rather than medical services.

1. C. L. Anderson, **School Health Practice**, St. Louis: C. V. Mosby Co., 1956. pp. 142-143.
2. California Medical Association, **First Conference on Physicians and Schools**, Fresno, 1954. p. 40.
3. C. C. Wilson (Editor), **School Health Services**, Washington, D. C.: National Education Association, American Medical Association, 1953. p. 38.
4. National Committee on School Health Policies of the National Conference for the Cooperation of Health Education: **Suggested School Health Policies**, 3rd Edition, Washington, D. C.: National Education Association, 1956. p. 17.

School districts that have made concentrated efforts to encourage the practice of examinations by private physicians have had rather successful results. Baker[5] reports that in Detroit this procedure has been used for many years and that 72% of the enrolling children have been examined and immunized. One elementary district in California reports that approximately 80% of its entering students are examined by family physicians, with no provisions being made for school physician services during the school year.

Recently Modesto, California public schools, a district of some 8500 elementary students with 18 schools, attempted to initiate a program of family physician examinations. In the spring, a pre-school round-up was held for children planning to enter kindergarten in the fall. One of its objectives was to encourage parents to have their own doctors give health examinations before the opening of school. When the parents came to the various schools during the round-up, they were provided with opportunities to meet the school nurses. Furthermore, they were given copies of health records in addressed envelopes and were requested to have the records completed by their family physicians and mailed to the schools before the beginning of the fall term. The nurses were also able to discuss with parents other health matters, including immunizations. As a result of this campaign, 882 children were registered at the round-up and 483 (55%) were examined by family physicians. Spasmodic attempts to encourage private doctor examinations had been made in previous years, but no more than 20% of the students ever had them completed.

Upon evaluating the results, the planning committee for the round-up concluded that:

1. The first concentrated effort to get health examinations completed by private physicians was very encouraging. Perhaps the higher percentages of participation attained in Detroit and other California districts could be reached.

2. Several additional things could be done to increase parental cooperation:

a. Obtain better and more timely newspaper publicity.

b. Obtain more help from the Parent-Teachers Association in publicizing the program.

c. Obtain support from the County Medical Society for the program in having private physicians establish a more or less uniform examination at a nominal fee.

5. Arthur G. Baker, "School Health From the Viewpoint of the Department of Health," **Pennsylvania Medical Journal**, Volume 59, August, 1956, cited by Byrd, **Health Yearbook 1956**. Stanford: Stanford University Press, 1957, pp. 195-196.

Modesto's method of encouraging examinations by family physicians is by no means the only effective one. Some schools may find it more convenient and effective to distribute health records to parents for completion by family doctors when children are brought for registration in the fall. However, these examination records might not reach the schools until several weeks after the start of the semester. In the spring, other schools may wish to use the newspapers to advise parents about having their children examined during the summer months. Regardless of what method is used, efforts should be made to have family physicians examine children, if possible.

It should not be concluded that school physicians services for health examinations will no longer be necessary if this responsibility is delegated to parents. There will still be a certain percentage of mothers and fathers who will be unable financially to afford these examinations; still other parents may not assume their proper responsibility. In addition, problems discovered in teacher and nurse observations may need prior referral to the school physician for preliminary appraisal. Thus, some routine physical examinations in schools will always be necessary.

The large number of examinations completed by family physicians in the Modesto public schools resulted in a more effective health services program in the following ways:

1. Children with health problems were identified early in the school year.
2. Program adjustments suited to children's needs were made early in the semester.
3. Teachers knew their health problem children sooner and were better able to make appropriate classroom adjustments.
4. Nurses had more time during the school year to follow-up cases needing guidance and to effect a greater number of corrections.
5. Nurses had more time to spend on other duties.
6. School physicians could concentrate their efforts on referral examinations and those appraisals not performed by family physicians. Also, school doctors had more time to perform better examinations on these children.
7. Fewer examinations done at school reduced the need to disrupt the normal school routine.
8. Parents became familiar with their responsibility early in the school life of their children. More junior and senior high school students would likely be examined by family physicians.

The American Medical Association, through its sponsorship of national, state, and local conferences, has greatly improved the cooperation between physicians and schools in recent years. It is these improved relationships that further enhance the chances of achieving a successful family physician examination program. With these relationships, it is now possible for rural school dis-

tricts, as well as those in urban areas, to get such programs started. Schools desiring to encourage health examinations by private physicians should organize school health committees with representatives from teacher, administrator, parent, nurse, medical society, and other community groups to develop their plans. Action committees of this type can be of tremendous help to elementary school administrators in their efforts to increase the effectiveness of their health services programs.

* * * * *

NEWS AND NOTES

ASIAN INFLUENZA EPIDEMIC, Bulletin 32, describes the national preparedness program planned by the U. S. Public Health Service. The Service's system for use of influenza vaccine is detailed; plans for manufacture of vaccine, vaccine priorities, and the proposed allocation system for vaccine distribution are given. The bulletin also contains a summary of information on the disease — its characteristics, attack and death rates, treatment and prevention.

COMMUNITY PLANNING FOR ASIAN INFLUENZA EPIDEMIC, Bulletin 34, reports on the recommendtions of State health commissioners of 15 States meeting with the U. S. Public Health Service. The bulletin highlights plans discussed at this meeting for helping States and local communities cope with an epidemic. The use of community resources, cooperation of community groups, schools and public gatherings, local facilities and services, and hospital care are some of the areas of concern for which helpful measures are suggested.

Copies of these bulletins are available at 25c each from the Social Legislation Information Service, 1346 Connecticut Avenue. N.W., Washington 6, D. C.

The Social Legislation Information Service, a nonprofit association, issues regular impartial reports on activities of Federal agencies and Congress in the fields of health, education, and social welfare generally.

* * * * *

HEALTH KNOWLEDGE OF TEACHERS

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One of the most important problems in the field of health education is the professional preparation of teachers for their work in the school health program. This situation is not new and, as in the past, is still in need of improvement.

However, before attempts can be made to effectively improve any condition we must first learn as much as possible about that condition. With this factor in mind studies were recently conducted in Oklahoma and Central California in an attempt to evaluate the health informational status of both prospective and experienced teachers.

Health Knowledge Studied: For collection of data a standardized health test consisting of 100 questions was used. The test was "Acorn Health Knowledge and Application Test." This instrument is composed of 60 multiple-choice items, dealing with selected health facts and concepts, with the remaining 40 questions, true-false in nature, testing ability to apply health knowledge to problem situations.

Characteristics studied for prospective teachers in addition to test scores were sex classification, type of certificate, and approximate number of hours of college credit in health courses and courses closely related to health. For experienced teachers consideration was given to number of years service, responsibility for health instruction, and approximate number of hours of college credit in health and closely related courses. These characteristics were selected for study because it was believed they would have the greatest influence on the test scores made by each group.

Tests were administered to 1,003 prospective and experienced teachers. The prospective teacher group included 404 student teachers from 10 cooperating colleges and universities in Oklahoma and 157 from Fresno State College in California. The experienced group included 310 from all geographical areas of Oklahoma and 132 teachers representing a large six county area in Central California.

Findings: In both studies the data revealed that prospective teachers in the field of health and physical education made scores that ranked them 4th from the top. These teachers are usually

given responsibility for whatever health instruction is offered in high school, therefore, this finding was not encouraging. Elementary teachers are another group expected to have some responsibility for health teaching. In Oklahoma they ranked 5th from the top and in California 7th from the top.

These studies indicate that health education experiences provided prospective health and physical education teachers at Fresno State as in colleges of Oklahoma have failed to give them necessary health information to enable them to demonstrate a superiority in health knowledge over students majoring in other subject areas.

Test scores for the experienced group in Oklahoma placed high school teachers at the top followed by elementary and junior high school teachers. In California high school teachers were again on top followed by junior high school and elementary teachers. It was further noted that test scores for experienced teachers were not greatly influenced by the number of reported hours of college credit in health or related courses, the degree of responsibility for health instruction, or number of years service as a teacher.

In the Oklahoma study prospective teachers made a mean score of 73.67 and experienced teachers a mean score of 73.86. The difference was not statistically significant. The mean scores for the two California groups were 77.75. for prospective teachers and 79.21 for experienced teachers. This difference again was not statistically significant. However, when prospective teachers from Oklahoma and California were compared, as well as the experienced groups from the two areas, the differences found were statistically significant at the .01 level.

Implications: These studies point to the need for more emphasis on health knowledge and its application for prospective teachers majoring in health and physical education. They indicate additional need for in-service work in health education for experienced teachers, especially at the elementary level. These two groups usually have most responsibility for health instruction. A lack of health knowledge for any of these teachers is likely to influence not only their own attitudes and practices but will in all probability have a direct influence on the attitudes and practices of the children they are teaching or will be teaching.

Health and physical education teachers have an important role in the school health program. Therefore, for these prospective teachers to assume this responsibility, it is necessary that teacher education institutions offer needed courses and opportunities for practical experiences in health education.

If colleges and universities fail to meet this need for effective programs of health education, including improvement in the health knowledge aspects of their curricula, they must be held responsible for the failure of prospective health and physical education teachers to acquire needed health information.

We must not let this failure occur.

* * * * *

DO YOU KNOW YOUR H Q (heart quotient)?

Do most people who have a heart disease die suddenly?

Are there many kinds of heart disease?

Do you know what services there are in your community for people with heart disease?

A "Heart Quiz" containing 20 of the questions like these you may be asking about your heart, together with answers will be sent upon request. Write Chicago Heart Association, 69 West Washington, or call Financial 6-4675.

* * * * *

Each year in Chicago more than 300 children die of congenital heart defects. To combat this situation, the Chicago Heart Association has initiated, with the United States Public Health Service the biggest project ever undertaken in this field. The project is known as the Congenital Heart Institute which has the expressed cooperation of Chicago's five medical schools and the health agencies of city and state.

* * * * *

Parents — a reminder — it is particularly important for your child to have a physical check-up at the beginning of the school year. Actually, a *heart* examination is a part of every complete *physical examination.* Now, says the Chicago Heart Association is a good time to make a date with your family physician for that examination.

* * * * *

Your heart is an efficient machine, more efficient and more enduring than any devised by man. In the course of a day it pumps ten thousand quarts of blood into 12,000 miles of arteries. If you would prove how much energy this involves, visit the Heart Exhibit of the Chicago Heart Association at the Museum of Science and Industry in Jackson Park, and work the electric hand grip in time to your normal heart beat—72 times a minute. See how tired you become. Then remember that your heart works this hard continuously from birth to death.

A STUDY OF GENERAL HEALTH KNOWLEDGE OF MALE FRESHMEN COLLEGE STUDENTS AT PENNSYLVANIA STATE UNIVERSITY

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Of what value is health knowledge? Some educators say that health knowledge is of little or no value. These educators indicate that they are more interested in instilling beneficial *health practices in their students.* They insist that knowledge of what good health practices are, does not mean that these good health practices will be adopted.

Other educators admit that it may be possible to induce elementary school children to practice certain supposedly "good" health habits, but as the students mature they start analyzing some of their habits and begin to wonder "why?" These educators maintain that students can't understand why certain "good" health habits should be continued unless they have the facts — the health knowledge. A rational background of knowledge means that the teaching of health facts has a place in the education of students. This thesis, if adopted, implies also that some way to measure this particular type of knowledge is important.

Various studies of the amount and type of health information possessed by students and adults have been made. In general, the investigators have found, in the students and adults studied, a great lack of correct health knowledge. However, there has been no general agreement as to the areas of health knowledge in which there was the greatest lack of information.

The purpose of this study was to appraise the health knowledge possessed by male freshmen students at The Pennsylvania State University at the beginning of a required course in health instruction. It was desired to determine: (1) the general level of attainment in regard to health information, (2) the specific areas in health knowledge in which the students were weak, and (3) the specific areas of health in which the students were already well informed.

The test used to gather the information in this study was the College Health Knowledge Test, Personal Health-Form A, by Dr. Terry H. Dearborn, University of California, Santa Barbara College, Santa Barbara, California. This test was designed to cover

information which one might expect entering college freshmen to have acquired in the field of healthful living, and included one hundred questions on both factual knowledge and on the knowledge of currently accepted practices and attitudes in 11 large areas of health.

Over a four year span — 1953-54 to 1956-57 — five thousand, four hundred and ninety male freshmen college students were given the health knowledge test on their first meeting for health instruction. Most of these students had graduated in the upper two-fifths of their high school classes. Approximately 90 per cent of the students had graduated from high schools in Pennsylvania.

The students were given approximately 50 minutes to complete the test. Any tests that were not completed by a student in the allotted time were eliminated from this study. The atmosphere during the administration of the test was one of quiet concentration. The papers were corrected and analyzed with the help of graduate students in physical education. The mean score of all these students was 55 (out of a possible 100). The 11 areas of health covered on this knowledge test, the number of questions in each area, the per cent of the questions answered incorrectly, and the rank of the areas, from most difficult to least difficult, follow:

Rank	*Area of Health Knowledge*	*Number of Questions*	*Per Cent of Questions Wrong*
1	Mental Hygiene and Integration	13	56.13
2	Medical Care and Advice	7	55.79
3	Exercise and Body Mechanics	10	50.85
4	Reproduction and Heredity	12	49.52
5	Hygiene of Special Organs	6	45.65
6	Excretion and Cleanliness	6	45.63
7	Nutrition and Diet	15	42.42
8	Social and Biological Background	6	39.88
9	Fatigue and Rest	6	39.00
10	Prevention and Control of Disease	14	35.78
11	Hygiene of Environment	5	34.39

The question missed most frequently (4,912 of the 5,490 students or 89 per cent answered it incorrectly) was: Deep breathing exercises (a) are of little value for the normal person, (b) clear the lungs of bacteria, (3) add considerable extra oxygen to the blood stream, (d) are helpful in cases of anemia, (e) are a satisfactory exercise program for the non-athletic person.

The question answered correctly most often (only 759 of the 5,490 students or 14 per cent answered it incorrectly) was: Fatigue from sedentary or mental work is best relieved by (a) tea or coffee, (b) an alcoholic drink, (c) a cigarette, (d) recreation of a physical type, (e) nonactive recreation.

Summary: If one assumes that this test is a valid test, this study revealed the following information: (1) the mean score of the 5,490 male college freshmen students over a four year span, 1953-54 to 1956-57, on this health knowledge test of 100 questions was 55. This score indicates that approximately half of the students would have failed this test if it were scored on an absolute basis of 60 per cent for a passing mark. Since the majority of the students accepted for matriculation at The Pennsylvania State University were in the upper two-fifths of their graduating classes, one may assume that the other graduating students would have made a lower mean score. Approximately 90 per cent of the students who took this test graduated from secondary schools in Pennsylvania. (2) Most of the students included in this investigation needed additional instruction in all of the areas of health covered by this test, as the lowest percentage of incorrect responses was 34 on the Hygiene of Environment area. (3) The students were weakest in the areas of Mental Hygiene and Integration and Medical Care and Advice. The percentage of incorrect responses for each of these areas was approximately 56.

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* * * * *

RECEPTION FOR ASSOCIATION MEMBERS AT THE CLEVELAND MEETING

The Health Service and Health Education Staff of the Cleveland Public Schools invite all A.S.H.A. members attending the Cleveland annual meetings to a reception in their honor.

The reception will be held in Parlors A & B of the Hollenden Hotel 5-6:00 p.m., Sunday afternoon, November 10th, 1957.

A. O. DeWEESE, M.D.

THE INCIDENCE OF HEARING LOSS IN KENTUCKY SCHOOL CHILDREN

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This report emanates from the Division of School Health, State Department of Health, Louisville, Kentucky. The authors wish to express their appreciation to Drs. Lad Mezera, Clyde Shelton, Paul Schneck, Bruce Underwood and Russell E. Teague, Commissioner of Health for their encouragement and cooperation in behalf of this research. The investigation spanned a two year period.

The need for a qualified estimate of the incidence of hearing loss in Kentucky school children has been of concern to numerous state agencies, teachers, speech therapists, physicians and psychologists throughout the state. To date, no published data exist concerning such incidence.

The published literature on the incidence of hearing loss in our school population in the United States generally states that approximately five percent have a loss requiring medical and/or educational follow up.

The primary purpose of the present investigation was to seek a representative estimate of hearing loss among Kentucky school children. The general plan was to test a large number of children located in various geographic areas of the state. A serious attempt was made to control the variables which usually influence the results of this type of investigation. These will be discussed below.

PROCEDURE

Sample: A total of 1,671 white elementary school children, enrolled in grades 2, 4, and 6, were tested individually. Eleven samples were selected from eleven different counties. There were 863 males and 808 females in the total test sample. The counties included in the investigation were Bracken, Caldwell, Carlisle,

Carter, Harrison, Jefferson, Ohio, Russell, Taylor, Trigg and Trimble. The counties represent various degrees of isolation as classified by Aurbach (1). Five of the counties are considered to be more urban in classification; the remaining six are spread on the rural end of Aurbach's rural-urban continuum.

Test instruments: Three recently calibrated, discrete frequency audiometers, Maico, model F-1, were used. These instruments permit the alternate presentation of the stimulus to either ear. Saw-toothed masking was used whenever the poorer ear differred by 20 db or more from the better ear at any frequency.

Testing rooms: Geographic location of each sample dictates that a testing room be selected in or near the school. Since the rooms vary as to their acoustic properties, it is necessary to equate them as to the relative effects of ambient noise. Audiograms were made in each testing room using a trained subject who had better than average hearing. Following each of these audiograms, the subject was re-tested in a sound treated laboratory room especially designed for acoustic experiments in the Audiology Clinic at the University of Kentucky. Tester, testee, psychophysical method, testing instrument and earphones were kept constant. Although this method is not ideal, it affords a way of relatively equating the masking effects of the ambient noise in each testing room. Thus, the data from each sample were corrected to rule out specific threshold shifts due to noise. Each instrument was periodically calibrated normal ears.

Screening method: Each subject was given a screening pure tone test in each ear at 15 db at the octave frequencies from 250-12,000 cycles. Each was given the following instructions:

> You will hear a tone through one of your earphones. If you hear it in the left ear, raise your left hand and if you hear it in your right ear, raise your right hand. Keep your hand up as long as you hear the tone. Raise your hand even when the tone is very faint.

Prior to the formal presentation of the stimuli, several tones were presented repeatedly well above threshold (usually 50 db) for orienting the subject to the task. After the instructions were read, the earphones were carefully placed on the subject by the tester to insure a good acoustic seal. A headband held each earphone in place. This provided certain obvious advantages over the youngster holding a single earphone manually. The order of frequencies tested was 1000, 2000, 4000, 8000, 12,000, 500 and 250 cycles. If the subject failed to respond at a specific frequency, the stimulus was repeated several times. If the subject failed the

additional presentations, his minimal thresholds at each test frequency in each ear were determined.

Threshold determinations: The tones were presented to the right and left ear in a non-systematic order. In addition to responding to the tone, the subject was asked to point to the ear being stimulated. The instructions were repeated identical to those in the screening procedure and the frequencies tested in the order described above. A modification of the conventional method of limits was used (8). Four to five descensions to threshold were made at each frequency in five db steps. The minimal response recorded was the modal value of the descensions. For example, if the minimal intensity responded to was 5 db in three out of five descensions, this value (the mode) was recorded on the audiogram. Repeat audiograms were made on all subjects who presented a testing problem. In addition to the sample tested, approximately 30 cases were considered untestable for various undetermined reasons and were therefore not included in the analysis. The "threshold" defined by this method is arbitrary, however, Goldman (5) found that this method gave reliable results comparable to standard threshold finding methods. Each of the three testers in this investigation had two or more years of experience in measuring pure tone thresholds.

TABLE 1.

Incidence of hearing loss in each county sample. Hearing loss defined as 20 db or greater at one or more frequencies in either ear.

County	*Number Tested*	*Hearing loss subjects*	*% Hearing loss*
1. Bracken	113	30	26.55
2. Caldwell	184	16	8.7
3. Carlisle	101	15	14.85
4. Carter	119	17	14.29
5. Harrison	195	20	10.26
6. Jefferson	179	22	12.29
7. Ohio	207	25	12.08
8. Russell	226	24	10.62
9. Taylor	158	26	16.46
10. Trigg	78	18	23.08
11. Trimble	182	20	10.99

RESULTS

Incidence of loss: In Table 1 is shown the incidence of hearing loss in each sample using a 20 db hearing loss criterion. The authors take the point of view that a 20 db pure tone loss at one or more frequencies in either ear represents a significant loss which rates medical consideration. Furthermore, the etiology of the loss

should be considered whether or not it is reversible by medical treatment.

Of the 1,671 children tested, 233 showed a 20 db or greater loss as defined above. This represents an overall average loss of approximately 14 percent. If this loss is representative of the elementary school population in Kentucky, then we are faced with an alarming number of children who need consideration in our hearing conservation program. Approximately one child in seven or 14 in every 100 attending school is involved. The Kentucky Educational Bulletin No. 4 (6) lists 493,434 elementary school children enrolled for the period 1955-56. From these figures, a conservative estimate would be 40,000-50,000 hearing loss children in the state.

When the data were examined for 30 db or greater losses at one or more frequencies in either ear, the mean incidence was 9 percent or 90 in every 1000 children. Early detection and prompt treatment of a hearing loss are not readily available to many of the children in our more isolated areas. Even the hearing loss child in an urban area may be neglected due to an unawareness of the potential detrimental effects of a mild loss.

Goldman tested a Kentucky sample of 709 elementary school children and found that approximately 11.4 percent had losses 20 db or greater. He found that 6.35 percent had 30 db or greater hearing losses. An identical comparison with Goldman's findings is not possible since he included 125 cycles and excluded 12,000 cycles as test frequencies.

Males vs. Females: Of the 863 males tested, 16.11 percent had 20 db or greater losses. Of the 808 females, 11.63 percent showed losses. The males had a greater incidence of loss, and the difference between the sexes was statistically significant at the .01 level, when tested by chi square ($x^2 = 7.09$ for 1 df.). Curry (2) also found a significant hearing loss difference between male and female pupils enrolled in grades 5, 7 and 9.

Monaural vs. bilateral losses: There were 108 monaural losses and 125 bilateral losses in the hearing loss group. Chi square was 1.08 and was not statistically significant for 1 df (4).

Right ear vs. left ear: In the text table below is shown the number of hearing losses in each ear.

	Right ear losses	*Left ear losses*	*Chi squares*
Males	103	110	.17
Females	69	73	.08
Both sexes	172	183	.28

Chi square did not show a statistical difference between ears. We can reject the hypothesis of a significant difference between right and left ears within or between sexes. These findings agree with the results by Curry (2) although he reported a tendency for losses to occur more frequently in the right ear than in the left.

DISCUSSION

When the data were analyzed using a 20 db hearing loss criterion, the incidence of loss was found to be 14 percent. Using a 30 db criterion, 9 percent of the sample comprised the hearing loss group. Based on the findings of this study, the need for a statewide hearing conservation program in Kentucky is apparent.

It seems important to examine the hearing loss child beyond considerations of organic hearing acuity. A youngster may fail the hearing test for reasons other than hearing loss. Important considerations are mental retardation, emotional disturbance, educational retardation or psychogenic hearing loss. These factors need to be carefully examined and ruled out as possible etiologies. The classroom teacher or the school nurse should not bear the burden alone. Curry (3) and Kodman (7) studied the effectiveness of the classroom teacher in detecting hearing loss children in the classroom and found that this method is considerably less effective than individual pure tone audiometry. A four member team consisting of the teacher, a physician, the school psychologist and at least one parent should screen each hearing loss child. Educational, medical, psychological or socio-economic factors may be contributing. If these are evaluated, then we can be more certain that the school youngster will have the maximum opportunity to benefit from his educational experiences.

The data were further analyzed relative to the differences between sexes, ears, and bilateral versus monaural losses. The differences between ears and bilateral versus monaural losses were not found to be statistically significant. There was a significant difference between sexes; that is, the males showed a higher incidence of loss than the females. This finding was also reported by Curry (2).

This report has dealt primarily with the incidence of hearing loss. A second report will deal with the follow-up procedures in the hearing conservation program and its implications.

SUMMARY

A sample of 1,671 white school children was tested by means of pure tone audiometry. The test sample was drawn from eleven

Kentucky counties to determine the representative incidence of hearing loss among school children within the state. The counties were fairly evenly divided on a rural-urban continuum; five were considered to be urban and six were considered to be rural.

The following were the major findings:

1. The incidence of hearing loss was 14 percent based on a 20 db criterion and 9 percent based on a 30 db hearing loss criterion.
2. No statistical difference was found between ears, or monaural versus bilateral losses.
3. A significant difference was found in the incidence of loss between males and females. The males showed a greater incidence of loss.
4. It was recommended that the hearing loss child be further evaluated to rule out mental retardation, educational retardation, emotional problems or psychogenic hearing loss.
5. The need for an extensive hearing conservation program is indicated on a statewide level.

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HEALTH PRECAUTIONS

The Food You Eat Becomes You!

Your general state of health can be a first-line defense against illness, particularly now that the season of infectious diseases is upon us, according to the Medical Department of the Equitable Life Assurance Society. Our resistance to complications following colds, "flu" and other illnesses are influenced by how we eat, sleep, exercise and relax — before we become ill, points out Dr. Norvin C. Kiefer, Chief Medical Director of the Equitable.

It's true that food, for example, means different things to different people — but the net effect is the same: food not only supplies the energy to keep us going, but it provides the building materials necessary to renew body tissues. In other words, good nutrition is mostly a matter of getting enough of the right foods — so you can do the things you want and need to do.

Because this is true, it's a good idea to take a look at your eating habits and those of your family every so often. Before the usual — or unusual — illnesses arrive is a good check-up time. Since your body needs all of the food essentials at *all* times, your regular diet should be built around: a serving of meat or fish a day, about four eggs a week, some cheese; two servings a day, at least, of vegetables, one dark green or yellow, either raw in salad or lightly cooked; two servings of fruit, including citrus fruit or juice; two glasses of milk each day or equivalent; and, some bread, potato or other grain products. Desserts, candy, and beverages such as soft drinks and coffee, are not essentials, but they are sometimes pleasant additions.

Other items in your diet can be as extensive or limited as you wish, provided you watch out for "spoon-in-mouth disease," leading to overweight! Underweight people should check with their doctors now, because too little weight can also lead to lowered resistance to illness.

One fact about food that perhaps cannot be over-emphasized is the value of a good solid breakfast. *And a coffee break isn't breakfast!* Many people find that the demands of their job in the home or in the office take so much out of them, they feel all used up by the end of the day. This is apt to be literally true, and especially so if they haven't had a good breakfast.

Many times an "all-gone" feeling in the late morning comes about something like this: When you get up in the morning, you've been without food for a good many hours. You're empty of food, which your body requires as fuel to keep you going. And yet you are not likely to know it — at least not in the sense of feeling hungry. You seem to get along for a few hours on a sub-standard breakfast, but sometime around 11 o'clock, you can't wait for lunchtime. Errors and mistakes in working are most apt to happen at this time.

To forestall fatigue, to reduce errors, to assure yourself of a steady level, fortify yourself with the sure combination: A good night's sleep and a really basic breakfast, such as fruit, toast, eggs or breakfast meat, cereal and milk.

Remember, too, as you review your breakfast and other eating habits, to take a look at your ways of eating, as well. The relaxed, pleasant meal . . . tempting, colorful dishes . . . good chewing to help digestion . . . good talk to increase your family's meal-time enjoyment — all are tools for better health.

DENTAL HEALTH EDUCATION EXPERIENCE FOR DENTAL STUDENTS

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University of Illinois College of Dentistry, Chicago, Illinois

The dental students at the University of Illinois have shown a constructive interest in dental health education. It became apparent seven years ago when three of our fourth-year students expressed a desire to conduct a dental health education project in a public school.

The objectives of this first study were:

1) To educate the child in the value of proper dental health and methods of obtaining it.
2) To determine the parent and child response to a dental health program in the public school.
3) To evaluate the parent and child awareness of the child's dental health.
4) To ascertain the degree of cooperation in such a program from school and staff.
5) To give the dental student experience in dental health education.

To avoid duplication and to work in cooperation with other efforts in the field of health education, it was necessary to clear through the Chicago Board of Education, the Chicago Dental Society, the American Dental Association and the Chicago Department of Health. With permission granted through these organizations, the choice of a neighboring school was made by the Board of Education.

Three portable dental chairs, operating units, and lights were loaned by the State Department of Public Health. Smaller pieces of equipment and instruments were borrowed from private sources and from the students' own supply. Since there were no funds provided for this project, the temptation to beg and borrow was great.

The students explained the proposed program to the principal, the assistant principal, janitor, and teachers whose classes might be involved. The fifth grade was selected as the youngest group and most desirable on the basis of discipline and comprehension. Before any child could participate in the project, it was necessary to send a form letter explaining the program to the parents for signatures of approval. In the meantime, to arouse interest in the program, recorded voices of such celebrities as Bob Hope, Bing Crosby and Tony Martin were played in the class room. The theme of the recordings was oral hygiene and wholesome diet.

Of the 35 children in the class, 26 forms indicating parental

consent were returned. The children were taken five at a time from the class during a morning and the project started with taking colored photographs of the teeth and gums of each child. Mercurochrome solution was used as a disclosing agent to reveal the dental plaques. The photography was followed by mouth inspection and prophylaxis which consumed about thirty minutes per child. A record was made of the number of carious lesions and restorations. Information was obtained on whether the child had ever visited a dentist. The parents were advised of the condition of the children's mouths. Where care was needed, it was specifically recommended that they see a dentist. In the words of one of the dental students, what they found in the mouths of some of these children was like "looking at an atrocity film in wartime." In addition to the prophylaxis, each child was given an unlabeled toothbrush and tube of toothpaste donated by a well known company.

Throughout the six months' period, the dental students carried on an educational program in which the children were taught a good method of toothbrushing. To demonstrate the toothbrushing technique, an over-sized model of dental arches and toothbrush were used. The children were required to bring their toothbrushes to class so as to practice the method under supervision. Mercurochrome solution was again used as the disclosing agent, after which each child observed in a large mirror stained areas that had been missed by the toothbrush. Each child was then instructed to brush his teeth, remembering where the stains occurred while the dental students observed his procedure and made suggestions where the technique was faulty. Observations in a mirror were again made and the difference in appearance noted. This procedure was particularly effective in impressing upon the child the unsightliness of unbrushed teeth and the time required for a thorough cleansing of all the surfaces.

The dental students stressed what they called the "Big three" in toothbrushing: *how*—in this case, the Fones circular method; *when*—immediately after each meal and before retiring at night; *why*—for the promotion of dental health.

The colored slides of the children's mouths, made at the beginning of the project, were projected in a darkened room and the shortcomings in oral hygiene were pointed out. To demonstrate the progress of dental caries occlusally and interproximally, models borrowed from the Department of Histology were set up at the front of the room. Other periods were devoted to the adequacy of diet and its relation to health, and the influence of high carbohydrate diet on dental caries. The children were given a vivid mental

picture of the approximate amounts of sugar in common items, such as soft drinks, candy, and chewing gum. The importance of visits to the dentist, supplemented by home care, was stressed as the easiest, least costly, and most comfortable way of mantaining dental health.

Movies, such as the one made during the Aurora-Peoria Project, depicting children cooperating in a dental health program, were shown. Other movies were "Dental Health, How and Why," "Save Those Teeth," "Winky the Watchman," and "The Child's First Visit to the Dentist," all of which were obtained through the American Dental Association film library.

During the project, the children were also involved in the statewide poster contest sponsored by the State Health Department at Springfield to promote interest in oral hygiene. Dental health consciousness was reflected in other courses in the school: the art and composition classes used dentistry as their central theme while the school paper publicized the dental program. Lacto-bacilli counts were taken at equally spaced intervals throughout the study. The procedure for taking saliva samples was explained to the teacher and children along with the reason for such collections.

Photographs in color were taken again for comparison with those taken at the beginning of the project. As expressed by the dental students, preventive dentistry is seldom spectacular and the results are hard to evaluate. An optimist might conclude that for the rest of their lives these children would have good oral hygiene habits, and they might also influence other members of their families. A pessimist might believe that as soon as the project was over the children would quit brushing their teeth. Both views are speculative. It can be stated, however, that twenty out of twenty-four pupils showed noticeably cleaner teeth and that in 12 of the 20 the improvement was marked. Each child could tell the story of how bacteria changes sugar, which decays teeth. This, however, does not mean that each child had changed his behavior. The dental students felt that they might have overdone part of their campaign, for they felt sure that there was not a girl in the class who thought she would be invited to a party if she did not brush her teeth. Almost as many dental restorations had been placed during this period as had been placed during the entire previous ten years. The caries activity was not reduced, as there was no reduction of lacto-bacilli count below 10,000 in the majority of cases.

The parents' response to the program was good insofar as approval of participation was granted to twenty-six of the thirty-five children in the class. This part of the program was disappoint-

ing, because it was impossible to meet and work with the parents. With few exceptions, the mothers were working outside of the home during the day and there was no suitable place to meet with them at night. Written questionnaires to the parents indicated that many of them were unaware of the condition of their children's mouths. The toothbrushes were the first that some of the children had ever owned.

The school personnel, from principals to engineers, was most cooperative and helpful. Similar projects have been welcomed back each year, and each year a new school has been added to fill the requests for this experience by an increased number of dental students.

This kind of a project has made an appeal to the students. There is an over-all policy which limits the students' activity, yet there is an area of freedom. The students have responsibility in planning their project. They have a situation in which both short-term and long-term rewards are realized. The students can further individual objectives at the same time they further common objectives. It is possible for them to encounter a series of concrete problems with which each group can deal to the mutual benefit of both school and dental student.

Acknowledgement with thanks goes to Dr. David Berman and Dr. Walter White for their suggestions, cooperation and photographic assistance.

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TUBERCULOSIS 1957

THESE ARE THE NATIONAL FIGURES:

Latest estimates indicate that *250,000 Americans have active TB*, 100,000 of them unknown to health authorities. In addition there are *1,750,000 people with inactive TB*, 550,000 of them still in need of medical supervision or public health follow-up. This means a total of two million Americans to whom TB is a personal problem.

An estimated *55,000,000 Americans are infected* with the germs that cause TB. About five per cent—or 2,700,000—will develop TB in their lifetime, if the present rate of development of disease from infection continues.

There are *100,000 new cases annually.*

The death rate was 9.1 per 100,000 population in 1955.

The annual cost of TB is estimated at $725,000,000, mostly in tax money. This figure includes money spent for prevention, detection, treatment, and compensation. It does not include wages lost by individuals because of TB.

OPPORTUNITIES FOR INTEGRATED EDUCATIONAL ACTIVITIES IN THE PROGRAM FOR THE PREVENTION OF TUBERCULOSIS

Los Angeles City School Districts—Auxiliary Services Division
Health Education and Health Services Branch

VERA C. NAEGELE, M.D.

FACULTY HEALTH COMMITTEE:

1. Stimulate interest of faculty and student body.
2. Present materials and use educational devices to provide health education on tuberculosis.
3. Arrange daily reminders of importance of program by public address system or bulletin for the weeks preceding, and week of the tuberculosis testing.

PUPIL HEALTH COMMITTEE:

1. Assist in planning and promoting the program within the school.
2. Assist with the Tuberculin Testing Program as monitors, dispensing badges and printed material.
3. Arrange displays of material on the prevention of Tuberculosis.
4. Exhibit pamphlets, posters, pictures, and books on Tuberculosis.

LIBRARY:

1. Prepare bibliography on Tuberculosis and Tuberculosis control.
2. Exhibit books, biographies and posters on control of Tuberculosis.

SUBJECT FIELD DEPARTMENTS

ART:

1. Make posters illustrating good health habits of cleanliness, rest and nutrition.
2. Make posters promoting Tuberculin Testing Program.
3. Arrange exhibits for display cases.

BUSINESS EDUCATION:

1. Type names on Mantoux Consent cards.

ENGLISH:

1. Learn scientific terms for vocabulary and spelling lists, necessary in understanding tuberculin testing and chest x-rays.
2. Study lives of writers whose productive years were handicapped by tuberculosis, i.e. Elizabeth Barrett Browning, John Keats, and others.
3. Give talks to home rooms concerning Tuberculin Testing Program.
4. Journalism: a. Prepare articles for school paper.
   b. Prepare daily bulletins.

FOREIGN LANGUAGE:

1. Translate pamphlets in Spanish, Chinese and Japanese.
2. Prepare letters in foreign languages for non-English speaking parents.
3. Present film, Tuberculosis, made by Disney for Spanish American countries.

HOMEMAKING:

1. Study the relationship between good nutrition and the prevention of Tuberculosis.
2. Study methods of preventing the spread of bacteria by cleanliness and sterilization.

INDUSTRIAL ARTS:

1. Prepare exhibits on the Tuberculin Testing Program for hall and library use.
2. Stress importance of health protection because of the hazards in industrial employment.

MATHEMATICS:

1. Study current statistical reports of diseases and make graphs showing decline of the death rates from Tuberculosis in this and other countries.
2. Study problems concerning the cost of tuberculosis control.
3. Make graphs of school participation in the testing program.

MUSIC:

1. Prepare music for assembly programs.
2. Study lives of Pagannini and Chopin, handicapped by Tuberculosis.

PHYSICAL EDUCATION (GIRLS AND BOYS):

1. Study relationship of good health habits to the prevention of Tuberculosis.
2. Emphasize the importance of regular physical examinations.
3. Present and discuss educational films.

SCIENCE:

1. Study methods of transmission of Tuberculosis by direct and indirect methods.
2. Study methods of destroying tubercle bacilli and other bacilli.
3. View the tubercle bacillus through the microscope; discuss culture of bacteria.
4. Review structure and function of lungs in relation to tuberculosis infection, disease, and treatment.
5. Study the history and theory of the use of x-ray. Inspect the x-ray unit.
6. Study effects of x-ray upon the body for diagnosis or treatment.
7. Study type and development of x-ray films.

SOCIAL STUDIES:

1. Study community agencies interested in the control of tuberculosis.
2. Study the relation of economic factors and living conditions to disease.
3. Learn the role of the World Health Organization in combatting tuberculosis and other communicable diseases.
4. Study control of bovine tuberculosis.
5. Develop maps of new cases and deaths caused by tuberculosis on local and/or state, national and international levels.

TUBERCULIN TESTING AND X-RAY PROGRAM OF STUDENTS IN THE SECONDARY SCHOOLS OF THE LOS ANGELES SCHOOL SYSTEM

PLANNING:

1. Schools scheduled for testing are notified the semester before the testing date and selected according to:
   a. Date of previous testing.
   b. Balance of areas of high and low incidence of tuberculosis.
   c. Recommendation of the Health Departments because of active case found in the school.

2. The Health Coordinator of each scheduled school is contacted at the beginning of the semester and organizes a planning committee meeting for representatives of the school administration, heads of departments, school health personnel, student body, Tuberculosis Unit Doctor and nurse for:
   a. Discussion of educational aspects, publicity and procedures of the testing program.
   b. Delivery of "request for testing" cards to be sent home to parents with an explanatory letter.
   c. Demonstration of samples of pamphlets and posters.
3. The program is introduced to the students at assemblies for the entire student body or in each Physical Education class.
   a. Suitable educational films are shown.
   b. Explanation of the program is given by the administrator, the health coordinator or the Tuberculosis Unit Nurse.
   c. Skits or demonstrations may be given by the students of the drama class, student body officers or student health committee.
4. The Health Coordinator and Tuberculosis Unit Nurse select suitable rooms for:
   a. Tuberculin testing and reading of tests.
      1.) A list of necessary equipment and supplies with a chart of the setup is furnished.
      2.) Room should be large (possibly corrective room) with good lighting and two entrances.
   b. Conference room for use by Tuberculosis Unit Nurse, students and their parents:
      1.) Needed approximately three weeks after testing, for duration of two weeks.
      2.) Should be near main office with telephone easily available and have adjoining waiting room for parents. It should furnish adequate privacy for conferences.
5. Arrangements are discussed for the x-raying of all positive Tuberculin reactors.

PROCEDURE OF TUBERCULIN TESTING:

1. The testing team consists of a chest specialist who is an employee of the Board of Education, a school nurse assigned to the Tuberculosis Unit, a clerk and sometimes Parent-Teacher Association volunteers or student helpers.
2. Students, each carrying his own "request card" signed by his parent or guardian, line up by Physical Education classses escorted by the Physical Education instructors to receive the tests. The student's left forearm is cleansed with alcohol.
3. The method of testing is the placing of one drop of tuberculin Purified Protein Derivative, .00025 mg, between the layers of skin on the forearm.
4. Two or three days later, each student is again given his card and passes in review before the Tuberculosis Unit Nurse. She interprets and records the results of the test.
5. Each student is given a suitable printed explanation of his test, whether "positive" (showing previous contact with some other person having active tuberculosis) or "negative."
6. These students with "positive" reactions proceed at once to the x-ray mobile unit for screening films of their chest. Other students who have missed the test, or for whom films are requested by the school health office, may also have x-rays made if they present a signed parental consent card.

7. Approximately three weeks after testing, parents of students with "positive" reactions will receive a request through the mail to visit the school and confer with the Tuberculosis Unit Nurse to discuss:
   a. The meaning of the positive tuberculin test.
   b. Possibility of contacts in the home and available clinics where x-rays may be obtained for them.
   c. Health habits necessary to maintain good health.

   If the parent is unable to be present, the report of the x-ray will be mailed to him.

8. If a student's x-ray (as interpreted independently by two chest specialists) indicates the need for further study, he will receive an appointment to report to the Yale Health Center for new x-rays. The confidential report will be mailed to the student and to the school health office. The Yale Health Center is a Parent-Teacher sponsored clinic.

9. If infectious tuberculosis is diagnosed in a student, he will be excluded from school. The school health office and the registrar of the school will be notified. He should not be allowed to return to school until cleared by the Advisory Chest Board of the Los Angeles City Schools.

10. A report of the survey, including diagnoses, will be sent to the Administrative and Health Offices.

11. Results of the tuberculin test and of the x-ray will be recorded on the individual health cards.

CHILDREN — BIGGER AND BIGGER

Are we destined to become a race of giants?

While no one can forecast the ultimate average size and weight of humans, it is true that today's children are bigger than those of a generation ago—not only in the United States but elsewhere.

Recent studies in this country and Europe show a trend in children's development which has become increasingly apparent over the years, reports NUTRITION REVIEWS, published by The Nutrition Foundation, Inc.

The Foundation is a non-profit organization supporting basic research and education in the science of nutrition. An editorial staff of well qualified scientists prepares NUTRITION REVIEWS, summing up and interpreting nutrition research around the world.

Medical examinations a full generation apart indicate the trend, NUTRITION REVIEWS reports.

In Philadelphia, children born in 1942 were 2½ to 3½ pounds heavier when they reached the first grade than had been children born in 1920. The youngsters from higher income areas were taller and heavier throughout this period than those from lower income sections.

Similar results were found in England where height-weight records from 1911-1953 were studied for 5, 8 and 12-year-olds. Analyzing a million school medical records, the researchers found urban boys and girls were 2 to 3 inches taller at age 5 in 1953 than in 1913, and 3 to 4 inches taller at ages 8 to 12. Boys were 4 to 6 pounds heavier at age 5. They were 7½ to 9 pounds heavier at age 8., and 14 to 17 pounds heavier at 12. Girls showed similar weight increases, except 12-year-old girls who may have increased 16 to 19 pounds.

The scientists found that the gains for rural English children appeared slightly less over this time period, but that the country youngsters had always been taller and heavier than their town contemporaries.

What's the reason for the increased size of English children? Improved nutrition undoubtedly played an important role. In 1907 the milk supply improved; in 1920 rickets began to disappear, and in 1934 the school milk program was started. These factors, along with various community and personal hygiene advances, helped boost children's health.

Bearing out the English studies was an analysis of school children in Glasgow, Scotland. It showed a progressive increase in height and weight from 1906 to 1949.

Germans, too, undertook a similar study, in part to check the influence of the World War II period on their children. They found that 11-year-old boys were 3 inches taller and 3.3 pounds heavier in 1940 than youngsters of the same age in 1920. Eighteen-year-old boys were 2 inches taller and 9 pounds heavier.

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CALORIE CONTROL

EAT AND GROW SLIM has been completely rewritten. Its menus are newly planned for interest and satisfaction. The latest thinking on the role of activity also has been incorporated into the time-tested approach to weight reduction — that of eating familiar foods in smaller amounts. The 1500-calorie-a-day provision in EAT AND GROW SLIM makes it possible to lose pounds without suffering those hunger pangs that create irritability and lower the spirits.

Single copies of this booklet are available free from Ellen H. Semrow, Director, Consumer Service Department, American Institute of Baking, 400 E. Ontario St., Chicago 44, Illinois.